# "Goals" (please blame Hank for title)

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*STAR Trigger meeting*

*BNL*

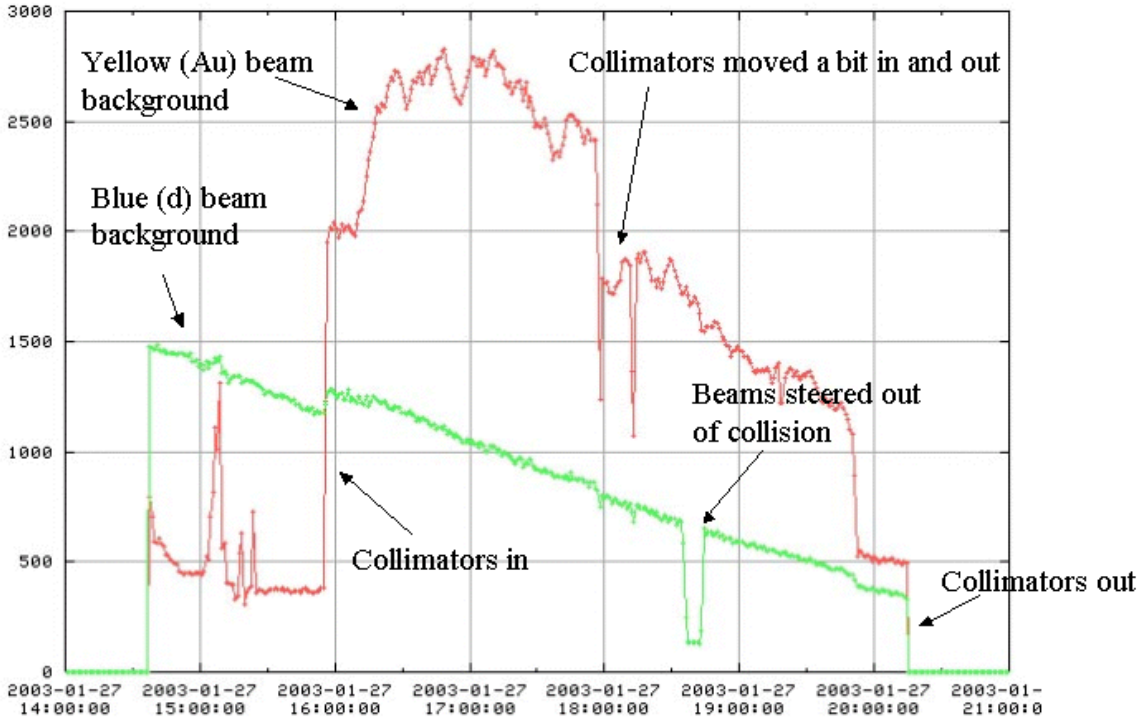
*September 26, 2003.*

**Outline:**

- **Goals of this meeting**
- **Discussion of level of detail necessary**
- **Brief list of Data sets requested**
- **Content of Summary document from meeting.**

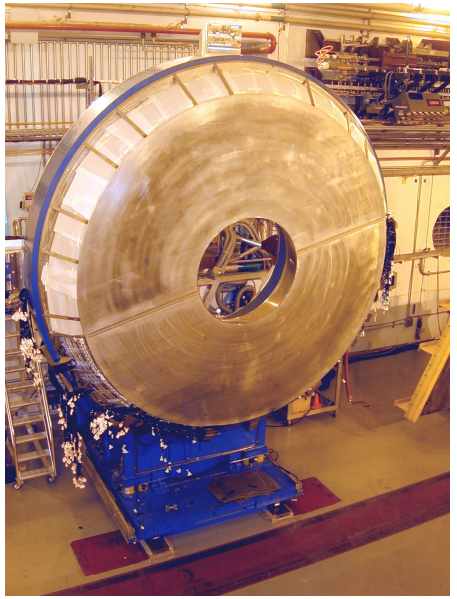
STAR BBC Background Plots for fill on Monday Afternoon, Jan. 27th.

Example: Yellow Background = Coincidence of BBC East + delayed (25 ns) BBC West



# Goals of Meeting

- Gather "Trigger" and Data sets Requests from Collaboration
- Discuss and Study Requests to the extent necessary to understand them in sufficient detail to:
  - Start working on Technical aspects of "Trigger" requests
  - Start discussion of logical combinations of Triggers to run in parallel
- Produce a document which details the draft conclusions/decisions (soon after the meeting)



# Level of detail desirable for Trigger requests

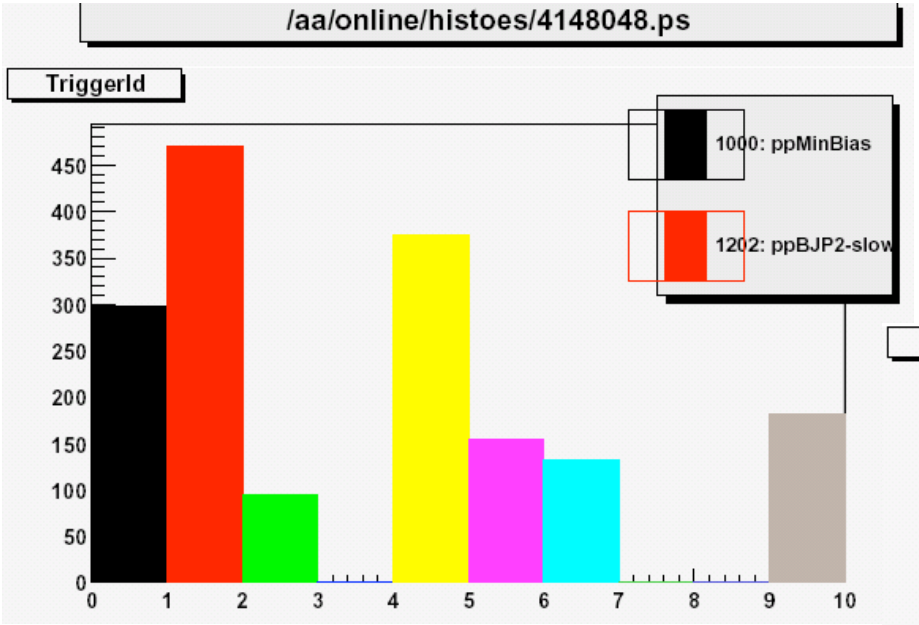

1. General “purpose” of Trigger (e.g. “min-bias”, “Central”, “Upsilon”, UPC, etc.)
2. Proposed “triggering” scheme (e.g. ZDC coin. Or BBC coin. + CTB> thres.
3. Detectors to be readout for this trigger (e.g. All, just trigger + xEMC, etc.)
4. Data Format desired for events (e.g. All full TPC ADC readout, All Daq 100, mix)
5. Any higher level trigger algorithms requested to run on selected events (L1, L2, or L3)
6. Any special readout stream requests (I.e. “Express Stream copy of data)
7. Optimum/desired running scenario for trigger (e.g. At mix of luminosities, run at ~ uniform rate over run, accumulate all triggers as quickly as possible, don’t care, etc).
8. Other specification needed?

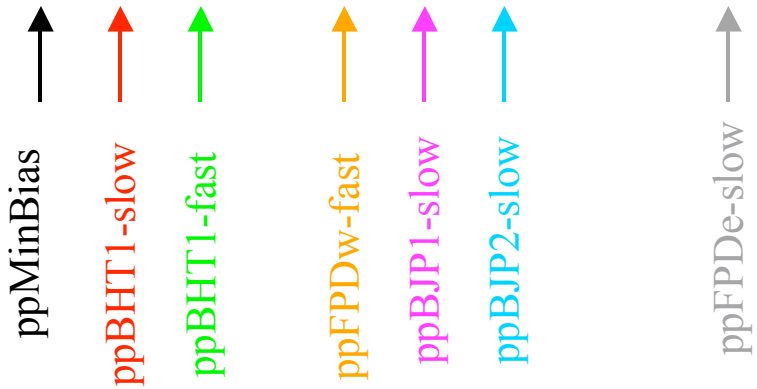
# Example of "Triggers to run in parallel"

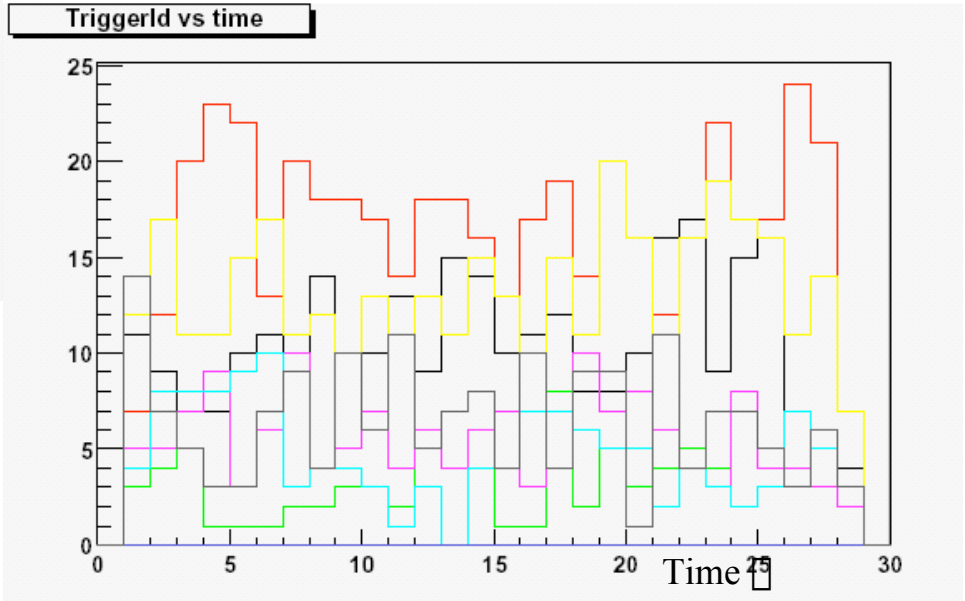
**More complex mix of triggers to optimize use of bandwidth and livetime.**

ame trg_mip_ppspin_030528.bin

| name | binary( daqTrgId) | offlineTrgId | numberOfEvents |
|---|---|---|---|
| ppMinBias | 1 | 1000 | 10531 |
| ppBHT1-slow | 10 | 1101 | 18090 |
| ppBHT1-fast | 100 | 1104 | 5442 |
| ppFPDw-fast | 10000 | 1005 | 25676 |
| ppBJP1-slow | 100000 | 1201 | 5622 |
| ppBJP2-slow | 1000000 | 1202 | 5444 |
| ppFPDe-slow | 1000000000 | 1003 | 6571 |
| ppFPDe-fast | 10000000000 | 1004 | 23348 |
| ppEHT1-slow | 100000000000 | 1151 | 5825 |




**Monitor time history of trigger mix for stability**

# STAR Physics Data set goals for Au-Au Run


- **Basic statement of Physics goals for Au-Au data set:**

**1.) Accumulate 30 M "useful" central events**

**2.) Accumulate > 50 M min-bias events**

**3.) Triggered spectra for $\pi^0$ out to $P_t$ of ~ 15 GeV/c**

**4.) Of order 5-10 k J/$\psi$ and first measurement of Upsilon in central collisions.**

**5.) High statistics sample for extending UPC measures.**

- **To achieve goal #1 above it is estimated that we need ~ 40 M (I.e. 30/.75) central events.**

**e.g. 10 weeks of data taking, at a rate of 23 Hz, with combined RHIC/STAR uptime of 45 hrs/wk**

**(10 wks)(45 hr/wk)(3600 s/hr)(25 Hz) 40 Mevts, or ( 50 % dead)**

**(5 wks)(45 hr/wk)(3600 s/hr)(50 Hz) 40 Mevts ( 100% dead)**

- **To achieve goal #2 above it is estimated that we need ~ 70 M (I.e. 30/.70) min-bia events.**

**(10 wks)(45 hrs/wk)(3600 s/hr)(43 Hz) 70 Mevts (50% dead), or**

**(5 wks)(45 hrs/wk)(3600 s/hr)( 87 Hz) 70 Mevts (100% dead)**

- **To achieve goal #5 above it is estimated that we need ~ 30 M "UPC type" events.**

**(10 wks)(45 hrs/wk)(3600 s/hr)(18 Hz) 30 Mevts (UPC type = UPC min-bias & topo)**

**Most likely case is that we will want to run with "mixed" triggers. Optimum %livetime not clear.**

## Suggested Contents for Document Resulting from this meeting

1. Brief table of data set goals for the Run (I.e. 40 Mevts raw central, 70 Mvts raw min-bias, 20 Mevts UPC topo, 10 Mevts UPC min-bias, J/$\psi$ & Upsilon, Triggered $\pi^0$ to 15 GeV/c, zero bias, etc.)
2. Section on expected event acculation rates under a few scenarios.
3. Detailed description of scheme for each individual trigger

   e.g. Hadronic min bias 1 = ZDC coin. + TAC cut + CTB > thres.

   Hadronic min bias 2 = BBC coin. + TAC cut + CTB > thres.

   Hadronic min bias 3 = ZDC coin. + CTB > thres.
4. Section detailing proposed Running configurations

   e.g. "Production Min-bias" ≡ prescaled mb1 + prescaled mb2 + prescaled mb3 + prescaled UPC mb1 + prescaled BHT1 +BHT2 + prescaled EHT1 + EHT2
5. Section detailing proposed DAQ readout schemes for various Triggers.
6. Section on proposed BIT assignments for TCU.
7. Estimated schedule for testing and bringing online various triggers.
8. …… Other contents?